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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/583,784	05/31/2000	Marcos N. Novaes	POU9-2000-0009-US1	4195

7590

07/02/2004

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EXAMINER

MAHMOUDI, HASSAN

ART UNIT

PAPER NUMBER

2175

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/583,784

Applicant(s)

NOVAES ET AL

Examiner

Tony Mahmoudi

Art Unit

2175

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

DOV POPOVICI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Remarks

1. In response to communications filed on 15-April-2004, claims 1-4, 7, 11, 14, 18, and 21 are amended per applicant's request. Claims 1-25 are presently pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6, 11-13, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Torbj rnsen et al (U.S. Patent No. 5,555,404) in view of Biliris et al (U.S. Patent No. 5,966,706.)

As to claim 1, Torbj rnsen et al teaches a method of recovery from failures within a shared nothing distributed computing environment (see Abstract, see column 3, lines 53-63, and see column 6, lines 9-11), the method (see column 6, lines 33-43) comprising:

detecting multiple overlapping failures (see column 10, line 63 through column 11, line 14, where "multiple overlapping failures" is read on "group failures") within the shared

Art Unit: 2175

nothing distributed computing environment (see Abstract, and see column 3, lines 53-63);
and

automatically recovering from the failure (see column 5, lines 47-55, where “recovery from failure” is read on “corrective on-line repair”, and see column 11, line 66 through column 12, line 6), wherein one or more transactions affected by the failure are automatically executed to completion without rolling back the one or more transactions and without requiring a reposting of the one or more transactions (see column 17, lines 29-37, and see column 18, lines 14-20.)

Torbjørnsen et al does not teach recovering from multiple overlapping failures.

Biliris et al teaches logging in a distributed database management computer system (see Abstract), in which he teaches recovering from multiple overlapping failures (see column 12, line 58 through column 13, line 46.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Torbjørnsen et al to include recovering from multiple overlapping failures.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Torbjørnsen et al by the teaching of Biliris et al, because including recovering from multiple overlapping failures, would enable the system to allow the operational nodes to continue accessing the pages they have in their local caches while the rest of the nodes are in the process of recovering, as taught by Biliris et al (see column 12, line 66 through column 13, line 2.)

Art Unit: 2175

As to claim 2, Torbjørnsen et al teaches a system of recovery from failures within a shared nothing distributed computing environment (see Abstract, see column 1, line 66 through column 2, line 5, and see column 6, lines 9-11), the system comprising:

means for detecting multiple overlapping failures (see column 10, line 63 through column 11, line 14, where “multiple overlapping failures” is read on “group failures”) within the shared nothing distributed computing environment (see Abstract, and see column 3, lines 53-63); and

means for automatically recovering from the failure (see column 5, lines 47-55, where “recovery from failure” is read on “corrective on-line repair”, and see column 11, line 66 through column 12, line 6), wherein one or more transactions affected by the failure are automatically executed to completion without rolling back the one or more transactions and without requiring a reposting of the one or more transactions (see column 17, lines 29-37, and see column 18, lines 14-20.)

For the teaching of “recovering from multiple overlapping failures”, the applicant is kindly directed to the remarks and discussions made in claim 1 above.

As to claim 3, Torbjørnsen et al teaches at least one program storage device (see column 4, lines 9-21) readable by a machine (see figure 3), tangibly embodying at least one program of instructions executable by the machine to perform (see column 18, lines 15-17) a method of recovery from failures within a shared nothing distributed computing environment (see Abstract, see column 3, lines 53-63, and see column 6, lines 9-11), the method (see column 6, lines 33-43) comprising:

Art Unit: 2175

detecting multiple overlapping failures (see column 10, line 63 through column 11, line 14, where “multiple overlapping failures” is read on “group failures”) within the shared nothing distributed computing environment (see Abstract, and see column 3, lines 53-63); and

automatically recovering from the failure (see column 5, lines 47-55, where “recovery from failure” is read on “corrective on-line repair”, and see column 11, line 66 through column 12, line 6), wherein one or more transactions affected by the failure are automatically executed to completion without rolling back the one or more transactions and without requiring a reposting of the one or more transactions (see column 17, lines 29-37, and see column 18, lines 14-20.)

For the teaching of “recovering from multiple overlapping failures”, the applicant is kindly directed to the remarks and discussions made in claim 1 above.

As to claims 4, 11, and 18, Torbjørnsen et al as modified, teaches wherein the shared nothing distributed computing environment (see Torbjørnsen et al, Abstract, see column 1, line 66 through column 2, line 5, and see column 6, lines 9-11) comprises a processing group (see Torbjørnsen et al, column 1, line 66 through column 2, line 13, where “processing group” is read on “node group”) with a plurality of members (see Torbjørnsen et al, column 3, lines 2-40, and see column 13, lines 11-19, and see figure 5 and 7A), and wherein the detecting comprises detecting multiple overlapping failures of at least some of the plurality of members (see Torbjørnsen et al, column 10, line 63 through column 11, line 14, where “multiple overlapping failures” is read on “group failures”.)

As to claims 5, 12, and 19, Torbjørnsen et al as modified, teaches wherein the recovering comprises synchronizing messages regarding the one or more transactions among surviving members of the processing group (see Torbjørnsen et al, column 5, line 56 through column 6, line 8, where “synchronizing messages” is read on “generating replicas simultaneously”, and “surviving members” is read on “remaining available nodes”).

As to claims 6, 13, and 20, Torbjørnsen et al as modified, teaches wherein the recovering further comprises committing the one or more transactions (see Torbjørnsen et al, column 6, lines 1-8, where “committed” is read on “stored”).

4. Claims 7-10, 14-17, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Torbjørnsen et al (U.S. Patent No. 5,555,404) in view of Biliris et al (U.S. Patent No. 5,966,706, as applied to claims 1-6, 11-13, and 18-20 above, and further in view of Badovinatz et al (U.S. Patent No. 5,805,786.)

As to claims 7, 14, and 21, Torbjørnsen et al as modified, teaches wherein at least one member of the processing group survives the failures (see Torbjørnsen et al, column 17, lines 26-33, and see column 18, lines 63-64.)

Torbjørnsen et al as modified, still does not teach wherein the recovering comprises electing a coordinator from among the at least one surviving member.

Art Unit: 2175

Badovinat et al teaches recovery in a distributed computing environment (see Abstract), in which he teaches wherein the recovering comprises electing a coordinator from among the at least one surviving member (see column 6, lines 1-7.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Torbjørnsen et al as modified, to include wherein the recovering comprises electing a coordinator from among the at least one surviving member.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Torbjørnsen et al as modified, by the teaching of Badovinat et al, because wherein the recovering comprises electing a coordinator from among the at least one surviving member, would enable the system to pass the duties of the recovery node to at least one of the nodes which survived the failure, in order for the surviving node to recover the failed transactions.

As to claims 8, 15, and 22, Torbjørnsen et al as modified, teaches wherein the recovering further comprises receiving by the coordinator a list of one or more transactions from other surviving members (see Badovinat et al, column 6, lines 15-23.)

As to claims 9, 16, and 23, Torbjørnsen et al as modified, teaches wherein the recovering further comprises receiving by the coordinator any commit protocol messages (see Badovinat et al, column 4, line 58 through column 5, line 2) for the one or more transactions the coordinator does not already have (see Badovinat et al, column 6, lines 50-67.)

As to claims 10, 17, and 24, Torbjørnsen et al as modified, teaches wherein the coordinator initiates the commit protocol for the one or more transactions (see Badovinatz et al, column 4, lines 35-41, and column 6, lines 42-46.)

5. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Torbjørnsen et al (U.S. Patent No. 5,555,404) in view of Biliris et al (U.S. Patent No. 5,966,706, as applied to claims 1-6, 11-13, and 18-20 above, and further in view of Duprey et al (U.S. Patent No. 6,671,705.)

As to claim 25, Torbjørnsen et al as modified, teaches the shared nothing distributed computing environment (see Torbjørnsen et al, Abstract, see column 3, lines 53-63, and see column 6, lines 9-11.)

Torbjørnsen et al as modified, still does not teach a distributed synchronous transaction system, and wherein the method comprises a failure recovery method for the distributed synchronous transaction system.

Duprey et al teaches a remote mirroring system (see Abstract), in which he teaches a distributed (see column 1, lines 22-24) synchronous transaction system (see column 8, lines 14-23, and see column 9, lines 47-50), and wherein the method comprises a failure recovery method for the distributed synchronous transaction system (see column 11, line 60 through column 12, line 2, and see column 15, lines 49-60.)

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Torbjørnsen et al as modified, to include a distributed synchronous transaction system, and wherein the method comprises a failure recovery method for the distributed synchronous transaction system.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Torbjørnsen et al as modified, by the teaching of Duprey et al, because including a distributed synchronous transaction system, and wherein the method comprises a failure recovery method for the distributed synchronous transaction system, would increase the efficiency of recovering transactions after a node failure, since “in synchronous remote mirroring, the master storage unit ensures that the host data has been successfully written to all slave storage units in the mirror before sending an acknowledgment to the host, which results in relatively high latency, but ensures that all slaves are updated before informing the host that the write operation is complete”, as taught by Duprey et al (see column 2, lines 18-23), and because “in synchronous remote mirroring, the slave image can differ from the master image by at most one write request, since the master storage unit updates all slave storage units for each write request. However, in asynchronous remote mirroring, the slave image can differ from the master image by more than one write request, since the master storage unit updates the slave storage units asynchronously with respect to the write requests”, as taught by Duprey et al (see column 9, lines 47-54.)

Response to Arguments

6. Applicants' arguments filed on 15-April-2004 with respect to the rejected claims in view of the cited references have been fully considered but they are moot in view of the new grounds of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


8. Any inquiries concerning this communication or earlier communications from the examiner should be directed to Tony Mahmoudi whose telephone number is (703) 305-4887. The examiner can normally be reached on Mondays-Fridays from 08:00 am to 04:30 pm.

Art Unit: 2175

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici, can be reached at (703) 305-3830.

tm

June 22, 2004



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